

Date: Wed, 8 Dec 93 16:14:12 PST
From: Info-Hams Mailing List and Newsgroup <info-hams@ucsd.edu>
Errors-To: Info-Hams-Errors@UCSD.Edu
Reply-To: Info-Hams@UCSD.Edu
Precedence: Bulk
Subject: Info-Hams Digest V93 #1437
To: Info-Hams

Today's Topics:

ARRL's callsign admin position
codes in rptr directory
Mods -> Kenwood TS450
r.misc Frequently Asked Questions (Part 1 of 3)

Send Replies or notes for publication to: <Info-Hams@UCSD.Edu>
Send subscription requests to: <Info-Hams-REQUEST@UCSD.Edu>
Problems you can't solve otherwise to brian@ucsd.edu.

Archives of past issues of the Info-Hams Digest are available (by FTP only) from UCSD.Edu in directory "mailarchives/info-hams".

We trust that readers are intelligent enough to realize that all text herein consists of personal comments and does not represent the official policies or positions of any party. Your mileage may vary. So there.

Date: 6 Dec 1993 12:59:32 GMT
From: agate!howland.reston.ans.net!gatech!usenet.ufl.edu!mailer.acns.fsu.edu!
freenet2.scri.fsu.edu!michaela@ames.arpa
Subject: ARRL's callsign admin position
To: info-hams@ucsd.edu

Re: Call Sign Administration Hassle

Nice set of comments, Brian. You are right on target.

ARRL needs to proceed slowly and responsibly on this one. I thought they had their "politically smart" hat on these days, but after this recent nonesense, I'm not so sure. It would be a tragedy for the FCC to get cold feet and back off because of arguments in the amateur radio ranks. Its been 15 years since the last call sign-request program was operational. That is a very long time. Its not the time to rock the boat as the FCC edges back into these waters, I feel.

Michael Christie, K7RLS
Crawfordville, Florida

Date: 8 Dec 93 20:57:36 GMT
From: news-mail-gateway@ucsd.edu
Subject: codes in rptr directory
To: info-hams@ucsd.edu

Just purchased ARRL repeater directory, and I'm seeing some abbreviations in the notes listings for which I don't find explanation. Could someone translate, please? (So far, I've been able to figure out the rest.)

p. 122, Florida New Port Richey notes: twa
t = tone access
w = ?
a = autopatch ?
twa = arrival airline required to access?

same page, Sarasota 3rd listing notes: ottabier
o = open
tt = touch-tone
a = autopatch
bi = misprinted bl for bi-lingual?
e = emergency power
r = rat on treadmill for power?
bier = ? Buy one of these for the owner of the repeater, to support use?

Need to know before Dec 20, when I get on the plane. Thanks!

Paul Marsh N0ZAU Omaha
pmarsh@metro.mccneb.edu

Date: Wed, 8 Dec 1993 12:47:18 GMT
From: iris.mbvlab.wpafb.af.mil!blackbird.afit.af.mil!blackbird!
jmiller@uunet.uu.net
Subject: Mods -> Kenwood TS450
To: info-hams@ucsd.edu

In article <GUMBY.93Dec8044301@world.std.com> Gumby@world.std.com (Rick H.)
writes:

Hi, My friend asked me to post this, as that he is looking for ANY

modifications for the Kenwood TS-450. He wants it to be able to TX/RX 11 Meters. But mods for this radio are desired...

Email Please gumby@ace.com
gumby@world.std.com

Gee...I always wanted a nuclear-strength flamewar for Christmas...:-)

(I've adjusted the Distribution:; no sense polluting the rest of the world)

73,

Jeff NH6ZW/N8 AFA1HE

Jeff Miller, NH6ZW/N8, AFA1HE (ex WD6CQV, AFA8JM, AFA1DO)
AFIT School of Engineering, Wright-Patterson AFB, OH. Help eliminate FOD.
Welcome to Ohio: Our state flower is the orange highway construction barrel.
55: It's not a good idea; it's just the law. E-mail me about the NMA.

Date: Tue, 7 Dec 1993 02:43:04 GMT
From: amd!amdalh!thunder!ikluft@decwrl.dec.com
Subject: rec.radio.amateur.misc Frequently Asked Questions (Part 1 of 3)
To: info-hams@ucsd.edu

Posted-By: auto-faq 3.1.1.4
Archive-name: radio/ham-radio/faq/part1
Revision: 3.0 1993/11/07 18:38:38

Rec.radio.amateur.misc Frequently Asked Questions Part 1 - Introduction to the FAO and Amateur Radio

This is a regular posting of frequently-asked questions (FAQ) about Amateur Radio, also known as Ham Radio. It is intended to summarize some common questions on the `rec.radio.amateur.misc` newsgroup and Info-Hams mail list as well as to help beginners get started.

Please provide a copy of the FAQ to any new or soon-to-be Hams you know.

Regular FAQ postings can help save network bandwidth and maintain a good signal-to-noise ratio in the newsgroup. However, they can't do it alone - you, the reader, have to use them. If you are a new user, please print and review the FAQ articles and look at the instructions in the news.announce.newusers newsgroup before posting any articles. If you are an experienced user, please

help by refraining from answering frequently-asked questions on the newsgroup if they are already answered by the FAQ articles. Instead, send e-mail to the user who asked the question. (It will be helpful if you include the part of the FAQ that answers their question, but not the whole thing.)

The FAQ cannot always prevent people from posting repetitive questions. But even if hundreds of questions get posted, it saves you from having to answer them hundreds of times. Also, a friendly pointer to the FAQ in your first answer can help that person refer to the FAQ in the future. That is when we can begin to get a real savings of network bandwidth.

To reduce the size of each article, the FAQ information is posted in 3 parts:

Part 1 - Introduction to the FAQ and Amateur Radio

Part 2 - Amateur Radio Organizations, Services, and Information Sources

Part 3 - Amateur Radio Advanced and Technical Questions

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--Rec.radio.amateur.misc Frequently-asked Questions-----Part 1--

** Introduction to the FAQ

* How to Contribute to the FAQ Articles

We accept suggestions from the Amateur Radio community. Please consider that all new contributions need to be SHORT and concise in order to be included. If a contribution is too long, the FAQ editors can help you find a more appropriate FTP archive or mail server for your article.

We always accept corrections. Please allow some time (often not the next issue of the FAQ) because the FAQ maintainers do this as volunteers so each must give higher priority to their employers.

Send correspondence to hamradio-faq@amdahl.com so that it will reach all the FAQ coordinators: (listed in alphabetical order)

Ed Hare	KA1CV	ehare@arrl.org	(Newington, CT, USA)
Jack GF Hill	W4PPT	root@jackatak.raider.net	(Brentwood, TN, USA)
Ian Kluft	KD6EUI	ikluft@uts.amdahl.com	(Santa Clara, CA, USA)
Michael Larish	KD6CTZ	nomad@ecst.csuchico.edu	(Chico, CA, USA)
Paul Schleck	KD3FU	pschleck@unomaha.edu	(Omaha, NE, USA)
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Steve Watt	KD6GGD	steve@wattres.sj.ca.us	(San Jose, CA, USA)
Rosalie White	WA1ST0	rwhite@arrl.org	(Newington, CT, USA)
Derek Wills	AA5BT	oo7@astro.as.utexas.edu	(Austin, TX, USA)

* Acknowledgements

All questions listed as modified "pre-4/92" are entirely Diana Carlson KC1SP's work or her editing of a contributor's work. Diana established this FAQ and credit is due to her for founding this project.

Thanks to Devon Bowen KA2NRC for accepting this FAQ in e-mail every month to keep the FTP archive at [ftp.cs.buffalo.edu](ftp://ftp.cs.buffalo.edu) up-to-date.

* Notes on "Netiquette"

The <rec.radio.amateur.misc> newsgroup and Info-Hams mail list have a large daily volume of traffic. They can operate more efficiently if the following netiquette guidelines are followed. Please take them seriously.

- * If you are new to UseNet, the introductory articles in news.announce.newusers are required reading. Go to that newsgroup now. Definitely, read the instructions there before posting anything. Other rec.radio.amateur.* readers will appreciate it!
- * Pick the right newsgroup. Use only the most specific newsgroup for your subject. For example, a question about a homebrew antenna only needs to be posted to rec.radio.amateur.antenna. Also, don't post to rec.radio.amateur.misc when the subject can go in another rec.radio.amateur.* newsgroup. So, when there is a more specific newsgroup, that's the one you want.
- * When posting a followup article, ALWAYS try to minimize the number of lines of quoted material from the original article.
- * As a general rule when you try to determine whether to reply to someone by e-mail or with a followup article, remember to "praise in public, criticize in private." It's OK to disagree technically but be careful not to attack the person with whom you disagree. Also, be careful with your use of the word "you" when posting a follow-up article. Many unnecessary flame wars have started that way.
- * Use a descriptive subject. For example, a message subject of "Ham Radio" tells the reader NOTHING about the contents of your article since the whole newsgroup is about Ham Radio. Other examples of subjects which are so broad that they become useless could include, "Help," "A Question," "Antennas," or "Frequencies." Maybe "Books on Antennas?" or "Where can I find Repeater Frequencies?" would be better, for example. Remember, in a busy newsgroup a lot of users decide which articles to read from the subject line alone. If you post, don't deprive yourself of an audience!
- * Before answering a question, check if the FAQ adequately answers it or if someone else already answered it. If you have more to add, make sure to reference either the FAQ or the related articles.
- * If a user posts a question which is directly answered by the FAQ, there is no need to post an answer - the information is already available on the newsgroup. Instead, just send an e-mail message which politely explains where to find the FAQ. They will probably appreciate it if you include the answer to their question. (Don't send a "nastygram" - that would just discourage future participation.)
- * Pay attention to the size of your audience - use the "Distribution:" header. If you leave it blank, your message will go to every civilized country in the world and occupy disk space in all news systems in all those places. If that's what you intend, that's fine but make sure your article is relevant outside your country. (In particular, Hams should already know there is more to the world than just their own country.)
- * If you have an item for sale, please limit the distribution area so that, for example, an article about a radio for sale in New Jersey won't get to California or Europe. If you wish, you may cross-post your for-sale article to rec.radio.swap.

* Software sources should be posted to either alt.sources, comp.sources.misc, or comp.sources.* for a specific machine type. Software binaries should be posted to the appropriate subgroup of comp.binaries.

** What is Amateur Radio?

Amateur Radio is a non-commercial radio communication service whose primary aims are public service, technical training and experimentation, and communication between private persons. Amateur Radio operators are commonly called hams. Hams often communicate with each other recreationally but also provide communications for others at public events or in times of emergency or disaster.

** Who can become a ham?

The answer to this question differs in every country.

The answer for the USA is listed below. If your country has a newsgroup specifically for it (i.e. UK, Australia, Germany) the most accurate answers can be found there. See Part 2 for the list of region-specific newsgroups.

If that doesn't help, the American Radio Relay League (ARRL) may be able to help because they communicate with similar organizations in other countries, probably including yours. They can be reached by electronic mail or surface mail (see Part 2.)

In the USA, anyone who is not a representative of a foreign government can be an Amateur Radio operator. There are tests that you must pass to get a license, however the tests are not insurmountable. On that general level, the requirements are probably similar in almost every country.

For more information on becoming a Ham in the USA, the ARRL has a toll-free number where you can request information: 1-800-32-NEW-HAM (don't worry about the number being one digit too long - the phone system ignores it.) Other information can also be obtained from the ARRL e-mail information server in the file called PROSPECT. Details on the server are in Part 2.

** Where can I locate information and books on Amateur Radio?

Your local Radio Shack sells some ham radios and Amateur Radio license books. Books can also be obtained through the mail from ham radio organizations, such as ARRL in Newington, CT (203-666-1541) and W5YI in Dallas, TX (1-800-669-9594). There may be one or two ham radio stores in the local area (ie, within 50 miles). Try looking in the Yellow Pages under Radio Communications.

For the Novice license, get a Novice License manual, plus 5-word-per-minute Morse code tapes, costing around \$25. For the Technician license, get a combined Novice and Technician License manual, and an FCC Rules manual, costing around \$32. The FCC Rules manual is a good idea for Novice also, but not necessary, since the Novice License manual contains all the FCC Rules that are required for the Novice License.

The ARRL Education Activities Department has several programs to help amateurs (or prospective amateurs) to get started. Ask for a "New prospect package" available free of charge, from ARRL HQ, Educational Activities Department, 225 Main St, Newington, CT 06111.

Information on Ham Radio can also be obtained with your computer. Part 2 of this FAQ contains a significant amount of material on that subject.

**** How much does it cost?**

To take the tests for any class of amateur radio license, there is a small charge (around \$5-\$6 currently) to cover copying costs and running the testing sessions. (Due to changes in 1993, Novice tests are under same procedures as the others.) The cost of a radio is really dependent on what you want to do. You can make your own radio and antenna for under \$150. You can buy a used single-band radio for \$150-\$300. Or you can buy a new multi-band multi-mode radio with all the doodads for \$300-\$3000. I'd suggest you learn more about ham radio, talk to local hams, find out what you want to do with ham radio first.

**** Where can I take the tests?**

The Novice tests Used to be given by any two qualified hams of General class license or above. Now all the license tests are given by three qualified Volunteer Examiners (VEs) who volunteer their time.

To locate an ARRL testing session in your area, you can contact ARRL at 203-666-1541 x282.

See also the section "Where can I find VE sessions in my local area?" in Part 2 because more information is available via UseNet.

**** What are the tests like?**

First off, come prepared to VE sessions. Bring: TWO forms of ID, one of which has a picture on it; a calculator (if necessary); a pen and two pencils; the applicable examination fee (around \$5-\$6 for 1993); the original AND a copy of your current Amateur Radio license (if you have one); the original AND a copy of any CSCEs for tests you've already passed (if you have any).

Each of the written tests (Novice, Technician, General, Advanced, and Extra) are generally a multiple choice test of approximately one-tenth of the question pool. For example, if the question pool is approximately 300 questions, then the test will be a 30-question test. You need to get 75% correct to pass. Note that they truncate to determine the correct number of questions. That means for a 30 question test, you need to get 22 right, which is actually only 73.3%.

Once you've paid the small fee for Technician-Extra tests, it costs no extra to take another test, so I'd suggest you keep taking the next more advanced test until you fail. If you pass the written but not the Morse code (or vice versa) for a specific class license, you have up to one year to take the other test before you would have to retake the written test again. Note that some VEs will not allow you to take the written test unless you've first taken the Morse code test.

The Morse code test is a receiving test only. The test run 5 to 7 minutes. After the test, you are given a 10-question multiple-choice or fill-in-the-blank test. Passing grade is 7 or more. If you fail the 10-question test, the examiner team will examine your copy sheet to see if you have 1 minute of solid copy with no errors. For 5 wpm, that's 25 characters, for 13 wpm, that's 65 characters, for 20 wpm, that's 100 characters. If they can find 1 minute solid copy, you've still passed.

Hints on Morse code tests: Generally, it will be a standard QSO (conversation), and it MUST contain at least one of each of the following:

26 letters A-Z, 10 numbers 0-9, comma (,), period (.), slant or slash (/), question mark (?), double dash prosign (BT), end of message prosign (AR), end of contact prosign (SK).

The letters count as one character, all others count as two characters. There are a couple other prosigns which are worth knowing, but will not be on the test, like "I'm done talking, next" is K, "I'm done talking, back to you" is KN, "Please wait" is AS.

** What can I do with a ham radio license?

There are so many things, it's a difficult question to answer, but here's some ideas:

- * Talk to people in foreign countries.
- * Talk to people (both local and far away) on your drive to work.
- * Help in emergencies by providing communications.
- * Provide communications in parades or walkathons.
- * Help other people become hams.
- * Hook your computer to your radio and communicate by computers.
- * Collect QSL cards (cards from other hams) from all over the United States and foreign countries and receive awards.

- * Participate in contests or Field Day events.
- * Provide radio services to your local Civil Defense organization thru ARES (Amateur Radio Emergency Service) or RACES (Radio Amateur Civil Emergency Service).
- * Aid members of the US military by joining MARS (Military Affiliate Radio System).
- * Participate in transmitter hunt games and maybe build your own direction-finding equipment.
- * Have someone to talk to on those sleepless nights at home.
- * Receive weather pictures via satellites.
- * Build radios, antennas, learn some electronics and radio theory.
- * Talk to astronauts in space, or use the moon to bounce signals back to people on the Earth.
- * Experiment with Amateur TV (ATV), Slow-Scan TV (SSTV), or send still-frame pictures by facsimile.
- * Experiment with amateur satellite communications.

** What can't I do with an Amateur Radio license?

The most important thing you can't do is transact business of any kind over ham radio. Interference to other hams or services, as well as obscene, profane or indecent language is not tolerated and is illegal. Music and broadcasting are not allowed on ham radio. Some personal conversations may not be appropriate to Amateur Radio. Do you really want the whole world to hear about Aunt Mabel's hemorrhoids?

** I'm interested, who will help me?

There are hams who are willing to become "Elmers" (mentors, helpers) in your local area. Look around and ask local hams. Search out local radio clubs. As well, some people have volunteered to be an Elmer over the Usenet. A list of UseNet Elmers and their e-mail addresses is posted to the newsgroup monthly. If anyone wants to be an Elmer, send e-mail to

elmers-request@unomaha.edu

There is also a lot to be said for exploring on your own. Take a look around the FTP archives and e-mail servers listed in Part 2. There's so much out there on UseNet, you'll find plenty of things you're interested in.

** Should I build my own equipment or antenna?

[see also <rec.radio.amateur.homebrew> and <rec.radio.amateur.antenna>]
"Homebrewing" is a fun and educational part of ham radio. It is a thrill to build your own transmitter and put it on the air. However, building your own receiver can be quite complicated; if you don't have electronics experience, you may want to buy a receiver instead. Most homebrew transmitters are QRP (transmit very low power). That's fine for an experienced ham with a very good antenna, but a Novice ham will

just get frustrated. Your first rig, therefore should NOT be a home-brew.

Antennas can be much simpler projects than the transceiver, though some types are also quite involved. Most hams build their own antennas for base station use and buy antennas for mobile (car) use. Most beginner ham books describe how to build different types of antennas. Order of difficulty, from easiest to more difficult, for some common antennas are: wire dipole, Zepp, Yagi, Quad, and Log-Periodic. Books from many sources, including ARRL and several Hams, discuss antennas in depth.

When building or even understanding antennas, it is good to know the relationship between the antenna element length and the frequency or wavelength it is designed for. An antenna performs best at multiples of 1/4 of that wavelength, though 5/8 wave also has beneficial qualities. The wavelength is related to the frequency with the following formula:

$$\text{wavelength (in meters)} = 300 / \text{frequency (in megahertz)}$$

You do not need a huge antenna or tower like ones you may see around your neighborhood. Large beam antennas and 40-foot towers are very expensive. As a beginner, a simple dipole antenna is perfectly adequate. As you gain experience (and money :-), you may want to invest in something bigger.

If you can afford new rigs and antennas, there are many mail order stores that advertise in ham radio magazines. If you want to buy a used rig, the best place is at a "hamfest" (ham flea market). You should take along an experienced ham, since some of the used equipment may be inoperative, overpriced or poor quality. You can also answer ads in ham magazines or posted at ham radio stores, although often, by the time you call, the equipment has already been sold.

Date: Wed, 8 Dec 93 18:53:00 GMT
From: library.ucla.edu!europa.eng.gtefsd.com!howland.reston.ans.net!cs.utexas.edu!
swrinde!sgiblab!uhog.mit.edu!xn.ll.mit.edu!ll.mit.edu!wjc@network.ucsd.edu
To: info-hams@ucsd.edu

References <1993Dec6.162309.23130@cirrus.com>,
<1993Dec7.234425.4647@ke4zv.atl.ga.us>, <1993Dec8.184205.20082@ll.mit.edu>
Subject : Re: hypochondriac scared of cancer!

In article <1993Dec8.184205.20082@ll.mit.edu>, wjc@ll.mit.edu (Bill Chiarchiaro)

```
writes:  
|>  
|> ...stuff deleted...  
|>  
|> Power Flux = Power / Area = 0.2570 W/m^2  
|>      = 2.570 mW/cm^2  
|> ...stuff deleted...  
|>  
|> Note also that to convert from W/m^2 to mW/cm^2 you need to multiply  
|> by 10.  
|>
```

Damn, I hit that "send" button too fast. The line about power flux should have read:

Power Flux = Power / Area = 0.2570 W/m^2
= 2.570x10^-2 mW/cm^2

The line about the conversion factor should have read:

Note also that to convert from W/m^2 to mW/cm^2 you need to divide by 10.

Sorry for the QRM.

73

Bill Chiarchiaro N1CPK
wjc@ll.mit.edu

Date: Wed, 8 Dec 93 18:42:05 GMT
From: library.ucla.edu!europa.eng.gtefsd.com!howland.reston.ans.net!cs.utexas.edu!
swrinde!sgiblab!uhog.mit.edu!xn.ll.mit.edu!ll.mit.edu!wjc@network.ucsd.edu
To: info-hams@ucsd.edu

References <1993Dec5.234801.25658@ke4zv.atl.ga.us>,
<1993Dec6.162309.23130@cirrus.com>, <1993Dec7.234425.4647@ke4zv.atl.ga.us>
Subject : Re: hypochondriac scared of cancer!

In article <1993Dec7.234425.4647@ke4zv.atl.ga.us>, gary@ke4zv.atl.ga.us (Gary Coffman) writes:

```
|>  
|> ...stuff deleted...
```

|>
|> Ok, I made a couple of simplifying assumptions, and I cheated the
|> numbers a bit to make it easier to calculate, and then I screwed up. :-(
|>
|> First I assumed an industry standard Class A transmitter power of 3 kW.
|> It turns out that's correct for this station. I ignored the 5.44 db gain
|> antenna used to bring the main lobe signal up to 10.5 kW ERP. Since our
|> poster is located below the main lobe, this assumption makes the calculation
|> give a higher value for field strength at his window than actually exists,
|> and it makes the calculation much easier. Now I cheated by assuming that
|> the station was on 2 meters instead of 104.1 MHz. That made a halfwave 1
|> meter. Then I screwed up by assuming field strength falls off with the
|> inverse \times square \times of distance, it doesn't, power does. Field strength
|> falls off linearly with distance. Arrrgh!
|>
|> Now let's go through it with more accurate numbers. A halfwave at 104.1
|> is $150/104.1$ or 1.44m. Now assuming a free space impedance of 377 ohms
|> the field strength across 1.44 meters is $\sqrt{3000 \times 377}$ or 1063.48 volts per
|> 1.44m at 1.44m. Now let's normalize the voltage across 1m, $1063.48/1.44=738.53$
|> volts/meter at a distance of 1.44m. Now 100 feet is 30.46 meters, so the
|> field strength decreases by $30.46/1.44=21.15$ times. So the volts per meter
|> at the window is $738.53/21.15=34.92$ volts per meter. I missed this by a
|> mile before. Note I'm not bothering with slant range from the top of the
|> tower, I'm just taking his 100 feet number for the distance.
|>
|> Note that the ***tower*** is 70 feet tall according to our poster, but
|> that's not the length of the ***antenna***. I'm assuming a single bay
|> for simplicity of calculation. That's a halfwave dipole. Now the field
|> strength will be maximum across a sphere with a diameter of a halfwave
|> that just encompasses the element because there's a 180 degree phase
|> shift across a halfwave and that gives maximum voltage. That also happened
|> to be 1 meter in my simplified calculation, but turned into 1.44 meters
|> in the more accurate calculation. Since field strength falls off with
|> the inverse of the distance, and since we know the voltage at 1.44 meters,
|> it's simple to find the voltage at 30.46 meters. Now the power density is
|> $P=E^2/R$. Since R for free space is 377 ohms, we have $34.92^2/377=3.23$ W/m².
|> Now divide that by 100,000 to get 0.0323 milliwatts/cm². I slipped a decimal
|> there before when calculating a power ratio directly. The power density is
|> well below the OSHA and ANSI limits.
|>

Something's still wrong here. The claim that the field strength
half a wavelength from the transmitting antenna is equal to the square
root of the product of the transmitted power and the impedance of free
space looks like a rule of thumb with which I'm not familiar. In any
event, I claim that the resulting field strength figure at 100 feet is
off by a factor of 3.55 (I don't know if this is close enough to pi to

be suspicious).

I calculate the field strength as follows (making the same isotropic antenna assumption as did Gary):

Radiated Power = 3,000 watts

Surface Area of
100-foot-radius
sphere centered
on antenna = 125,664 ft²
= 11,675 m²

Power Flux = Power / Area = 0.2570 W/m²
= 2.570 mW/cm²

Electric Field Strength = sqrt(Power Flux * Free-Space Impdnc)
= sqrt(0.2570 W/m² * 377 ohms)
= 9.84 V/m rms

Note also that to convert from W/m² to mW/cm² you need to multiply by 10.

73

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End of Info-Hams Digest V93 #1437

